

What is claimed are:

1. A method of forming an oxynitride film, comprising the steps
of:
loading a silicon substrate into an oxidization furnace;
5 implanting an oxygen based source gas into the oxidization furnace to
grow a pure silicon oxide film on the silicon substrate;
blocking implantation of the oxygen based source gas and implanting an
inert gas to exhaust the oxygen based source gas remaining within the
oxidization furnace;
10 raising a temperature within the oxidization furnace to a nitrification
process temperature;
stabilizing the temperature within the oxidization furnace;
implementing a nitrification process for the pure silicon oxide film by
implanting a nitrogen based source gas; and
15 stopping implantation of the nitrogen based source gas and rapidly
cooling the oxidization furnace while implanting the inert gas into the
oxidization furnace.
2. The method as claimed in claim 1, wherein the nitrogen based
20 source gas is a NH_3 , N_2O or NO gas.
3. The method as claimed in claim 2, wherein when the
nitrification process is implemented, Ar or N_2 is implanted along with the
nitrogen based source gas.

4. The method as claimed in claim 1, wherein the nitrification process temperature is a temperature at which a viscous flow of a SiO_2 film may happen and the nitrification process is implemented at a temperature that
5 is higher than the temperature at which the viscous flow of the SiO_2 film may happen in order to relax stress occurring when nitrogen is implanted into a Si- SiO_2 interface.

5. The method as claimed in claim 1, wherein the nitrification
10 process is implemented at a temperature higher than 800°C .

6. The method as claimed in claim 1, further comprising the step of implementing an annealing process of precluding implantation of the nitrogen based source gas and raising the temperature of the oxidization
15 furnace to a temperature higher than the temperature at which the nitrification process is implemented while implanting an inert gas into the oxidization furnace, before the step of cooling the oxidization furnace after the nitrification process is implemented.